

REMARKS

As an initial matter, the Applicants would like to thank Examiner Kantamneni and Examiner Padmanabhan for their time and consideration during the telephonic Examiner Interview conducted on April 15, 2009.

(I) General Overview

The Applicants have amended the claims in a manner consistent with the previously proposed amendment that was submitted March 27, 2009, and discussed April 15, 2009, during the Examiner Interview. The Applicants respectfully submit that all previous grounds for rejection have been overcome and/or are no longer applicable.

Attached hereto is data regarding the use of propionic acid alone and HMTBA alone. The data supports the unexpected results of the currently claimed invention. In particular, the data indicates that propionic acid alone or HMTBA alone would not be effective against *Salmonella* in feed. The Applicants' currently amended claims recite a method of inhibiting or killing microbes comprising *Salmonella* in feed. The data indicates that the currently claimed invention is effective at inhibiting or killing microbes comprising *Salmonella* in feed, and is therefore surprising and unexpected over the individual ingredients. The Applicants respectfully submit that all pending claims are in condition for allowance.

(II) Summary of the Claimed Invention

The Applicants' currently amended claims are directed to methods of inhibiting or killing microbes comprising *Salmonella* in feed. The problem specifically addressed by the claimed method of use has not been solved by the prior art. The Bland, Dunn, and Enthoven references all teach away from the currently claimed invention by identifying that the individual components are substantially ineffective at killing *Salmonella* in feed. Bland specifically teaches away by identifying that propionic acid and other organic acid combinations may be antimicrobial in solution, but are ineffective at killing *Salmonella* in feed. Bland states that to kill *Salmonella* in feed, essentially all of the *Salmonella* must

be killed, and formaldehyde is required. Read in context, therefore, Bland indicates that the binary blend of propionic acid and formic acid in Dunn would also be inadequate for the currently recited method of use. "Methods that kill 95% or even 99% are largely ineffective because the residual bacteria can multiply rapidly and recontaminate the feedstuff, and eventually the entire processing facility." Although neither Bland nor Dunn discuss HMTBA, Enthoven specifically states that, "The results show that there is no inhibitory effect of HMB or formic acid on *Lactobacillus* or *Salmonella*." Thus, Bland, Dunn, and Enthoven all teach away from combining the recited elements for the currently claimed use for inhibiting or killing *Salmonella* in feed, such that one of skill in the art would have no reason for combining them in the manner claimed and no reasonable expectation of success. The data of record further establishes that propionic acid alone or HMBTA alone would have been insufficient for the currently claimed invention.

As exemplified by claim 75, the currently pending claims recite, "A method of inhibiting or killing microbes comprising *Salmonella* in food, the method comprising treating the food with an organic acid composition comprising at least three organic acids, the organic acid composition comprising 2-hydroxy-4-(methylthio)butanoic acid and at least two organic acids chosen from butyric acid, lactic acid, and propionic acid, wherein the organic acid composition inhibits or kills more *Salmonella* in the food compared to when the food is treated with any single organic acid that forms the organic acid composition." The prior art fails to teach or suggest each every element of the currently amended claims. Nowhere in the prior art has it been shown or suggested to combine HMTBA and at least two organic acids chosen from butyric acid, lactic acid, and propionic acid for the currently claimed method of use. In fact, the prior art teaches away from the individual components as being ineffective for the currently claimed method. In other instances, the prior art identifies that the individual elements are incapable of being combined in the manner currently claimed by the Applicants. One of skill in the art would previously have had no motivation to combine and no expectation of success regarding the currently claimed combination of elements for the recited methods. Finally, the evidence of record substantially supports a finding of unexpected

results regarding the currently claimed invention, which is sufficient to overcome the current rejections. Reconsideration of the amendments and remarks made herein is respectfully requested.

(III) Status of the Claims

Claims 75, 77-104, and 113-133 were previously pending and stand rejected according to the non-final Office Action ("Office Action") issued December 23, 2008.

Claims 96-104, 113, 118-120 and 133 have been canceled without prejudice. The Applicants reserve all rights in the subject matter of the canceled claims. Claims 75, 114-117, 121, 124, 127, and 130 are currently amended. Claims 134-137 have been added. The amendments to the claims are supported by the originally filed claims and specification and do not add new matter. Claims 75, 77-95, 114-117, 121-132, and 134-37 are currently pending. The Applicants respectfully request entry of the amendments and solicit allowance of all pending claims.

(IV) 35 U.S.C. § 112 Rejections

Claim 133 was rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for reciting the term "improved odor." This rejection is considered moot as claim 133 has been canceled without prejudice.

(V) 35 U.S.C. § 103 Rejections

A. Claims 75, 77-87, 90-93, 96-97, 99-104, 113, 115-119, and 133 are patentable over Dunn in view of Enthoven

Claims 75, 77-87, 90-93, 96-97, 99-104, 113, 115-119, and 133 were rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Dunn et al. (U.S. 4,824,686; "Dunn") in view of Enthoven (see original IDS; "Enthoven").

The Applicants' currently claimed invention recites a method of inhibiting or killing microbes comprising *Salmonella* in food the method comprising treating the food with an organic acid composition comprising at least three organic acids, the organic acid

composition comprising 2-hydroxy-4-(methylthio)butanoic acid and at least two organic acids chosen from butyric acid, lactic acid, and propionic acid, wherein the organic acid composition inhibits or kills more *Salmonella* in the food compared to when the food is treated with any single organic acid that forms the organic acid composition. Whether alone or in combination, the cited art fails to teach each and every recited element.

1. Dunn

Dunn is alleged to teach a binary blend of formic acid and propionic acid as a preservative. See Office Action, at pg. 3, lines 16-17. Dunn in view of Enthoven, however, fails teach or suggest "at least two organic acids chosen from butyric acid, lactic acid, and propionic acid." As such, Dunn in view of Enthoven fails to teach at least 2 of the 3 acids required by the claimed methods. Dunn in view of Enthoven also fails to teach or suggest "2-hydroxy-4-(methylthio)butanoic acid" for the currently claimed method of use. It will be shown below that Enthoven teaches away from 2-hydroxy-4-(methylthio)butanoic acid as being ineffective for the currently claimed method. Accordingly, Dunn in view of Enthoven therefore fails to teach the claimed method of using "2-hydroxy-4-(methylthio)butanoic acid and at least two organic acids chosen from butyric acid, lactic acid, and propionic acid," for inhibiting or killing *Salmonella* in feed. Whether alone or in combination, Dunn in view of Enthoven fails to teach or suggest the currently claimed combination of organic acids for the claimed method of inhibiting or killing *Salmonella* in feed.

2. Enthoven

Enthoven is alleged to teach 2-hydroxy-4-(methylthio)butanoic acid as having an antimicrobial effect. The Applicants respectfully assert that this characterization of Enthoven is mistaken with regard to the currently claimed invention, which recites a method of inhibiting or killing microbes comprising *Salmonella* in food. Enthoven *et al.* disclose that 2-hydroxy-4-(methylthio)butanoic acid and formic acid are **not effective as antibacterial agents against *Salmonella***. In particular the abstract discloses "the results show there is **no inhibitory effect of HMB** (i.e., 2-hydroxy-4-(methylthio)butanoic acid) **or formic acid on *Lactobacillus* or *Salmonella***." As such, Enthoven **teaches away** from the cited combination. The fact that all embodiments of

Dunn require formic acid and Enthoven states that formic acid has no inhibitory effect on *Salmonella* is an additional teaching away. It is respectfully asserted that the basis for which Enthoven has been undercut, or that there would have been no expectation of success or predictability in combining the references identified by the Office. Enthoven fails to teach HMB as providing any antimicrobial effect with regard to *Salmonella* in feed. Specifically, Dunn in view of Enthoven also fails to teach the claimed method of using "2-hydroxy-4-(methylthio)butanoic acid and at least two organic acids chosen from butyric acid, lactic acid, and propionic acid." Whether alone or in combination, Dunn in view of Enthoven fails to teach or suggest the recited claim elements or the unexpected results previously submitted by the Applicants. The data submitted by the Applicants further shows that propionic acid alone or HMTBA alone are insufficient for the purposes of the currently claimed invention.

3. Doctrine of *In re Kerkhoven* Not Applicable

It has previously been shown that all elements of the Applicants' currently claimed invention have not been taught or disclosed. It has also been shown that Enthoven teaches away with respect to use of HMB for either killing or inhibiting *Salmonella* in food. Specifically, Enthoven states that there is no inhibitory effect of HMB or formic acid on *Lactobacillus* or *Salmonella*. *In re Kerkhoven* requires that agents be known as useful for the same purpose. Consequently, the doctrine of *In re Kerkhoven* does not apply to the current case because Enthoven teaches away from the presently claimed methods of use.

4. No Motivation to Modify the Cited Art

To establish a prima facie case of obviousness, the Office must also establish that a skilled artisan would be motivated to modify the reference's disclosure to arrive at the claimed invention. It has been shown that Dunn and Enthoven are incompatible references with respect to the currently claimed invention. Enthoven expressly states that HMB shows no inhibitory effect with respect to *Salmonella*. Applicants respectfully submit there would be no motivation to combine the references to arrive at the currently amended claims directed a method of inhibiting or killing microbes comprising *Salmonella* in food.

5. No Reasonable Expectation of Success

To establish a *prima facie* case of obviousness, the Office must also establish that a skilled artisan would have a reasonable expectation of success for producing the claimed invention if the proposed modification or combination were made. For the reasons detailed below, the Office has not met its burden for this third prong of the obviousness standard. The claimed methods involving the specific acids identified would not have been known or otherwise predictable at inhibiting or killing microbes comprising *Salmonella* in food. Thus, the Applicants respectfully submit that the currently pending claims are in condition for allowance.

6. Evidence of Non-Obviousness

The Applicants respectfully request that the currently amended claims be considered with respect of the experimental evidence and declaration, previously of record, which show an unexpected result and non-obviousness of Applicants' claimed invention. The Applicants have previously submitted a graph (*i.e.*, Figure 7), which shows that the Applicants' claimed composition shows dramatic improvement in antimicrobial activity against *Salmonella* in feed. The synergistic effect reflected by the data is both unexpected and beyond any of the individual components similarly tested. The data further indicates that propionic acid alone or HMTBA alone are insufficient for the purposes of the currently claimed invention. The evidence of record also includes the Declaration of Dr. Christopher Knight, submitted on September 26, 2007, which articulates the unexpected result shown in the data. The following excerpt is from Dr. Knight's submitted declaration at paragraph four:

"With reference to the attached graph, data is depicted for the antimicrobial activity of five different organic acid compositions against *Salmonella* in feed. The five organic acid compositions include: (1) 0.45% HMTBA alone (*i.e.*, 2-hydroxy-4-(methylthio)butanoic acid, which is a compound of Formula (I) in the '434 application); (2) 0.45% butyric acid alone; (3) 0.45% lactic acid alone; (4) blend OA 4, which is 0.15% lactic acid, 0.15% propionic acid, and 0.15%

HMTBA; and (5) blend OA 6, which is 0.1 % lactic acid, 0.1 % butyric acid, 0.1 % propionic acid, and 0.15% HMTBA . . .

As depicted in the graph, the antimicrobial activity of either blend OA 4 or blend OA 6 achieved significantly higher killing of *Salmonella* at lower concentrations than could be achieved with any of the single organic acids alone.

Applicants respectfully submit that blend OA 4 and blend OA 6 are commensurate with the scope of the currently pending claims. Consideration of the objective evidence showing non-obviousness of the currently claimed invention is respectfully requested.

**7. Statutory Criteria for Obviousness Has Not Been Met;
Obviousness Has Been Rebutted**

In order for a *prima facie* case of obviousness to exist, three criteria must be shown: (1) a finding that the prior art included **each element claimed**; (2) a finding that one of ordinary skill in the art could have combined the elements as claimed by known methods wherein **each element merely performs the same function as it does separately**; and, (3) a finding that **one of ordinary skill in the art would have recognized that the results of the combination were predictable**. For the reasons articulated above, the criteria for obviousness have not been met. The Applicants have identified several elements that were not taught or suggested by the prior art. The Applicants have also identified teachings away such that the elements do not perform the same function as they do separately, and there would have been no expectation of success in arriving at the claimed invention.

In addition to a *prima facie* case of obviousness not being established, the Applicants further assert that the evidence of record has also rebutted obviousness. In particular, the results of the claimed combination were unexpected. One of ordinary skill in the art could not have combined the claimed elements by known methods, and the elements in combination do not merely perform the function that each element performs separately. The Applicants therefore respectfully request withdrawal of the instant rejection and seek allowance of all pending claims.

B. Claims 88-89 are patentable over Dunn in view of Enthoven and Pinski

Claims 88-89 were rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Dunn in view of Enthoven as applied above, and in further view of Pinski (U.S. 2002/0172737; "Pinski").

The arguments asserted above with regard to Dunn and Enthoven are hereby reasserted and incorporated with respect to claims 88-89. The Applicants' currently claimed invention recites a method of inhibiting or killing microbes comprising *Salmonella* in food the method comprising treating the food with an organic acid composition comprising at least three organic acids, the organic acid composition comprising 2-hydroxy-4-(methylthio)butanoic acid and at least two organic acids chosen from butyric acid, lactic acid, and propionic acid, wherein the organic acid composition inhibits or kills more *Salmonella* in the food compared to when the food is treated with any single organic acid that forms the organic acid composition. Whether alone or in combination, the cited art fails to teach each and every one of the recited elements. It has been previously shown that Enthoven teaches away from Dunn, and does not provide any antimicrobial teachings with regard to HMB for *Salmonella* in feed.

Dunn in view of Enthoven and Pinski fail to teach "a method of inhibiting or killing microbes comprising *Salmonella* in food the method comprising treating the food with an organic acid composition comprising at least three organic acids, the organic acid composition comprising 2-hydroxy-4-(methylthio)butanoic acid and at least two organic acids chosen from butyric acid, lactic acid, and propionic acid. . . ." as currently recited by the Applicants. Specifically, none of the cited references alone or in combination disclose, teach, or suggest butyric acid or lactic acid as recited in the currently amended claims. Neither Dunn nor Pinski disclose 2-hydroxy-4-(methylthio)butanoic acid, and Enthoven has been shown to **teach away** from any antimicrobial activity with regard to *Salmonella* in feed. Additionally, as previously identified at pages 21-22 of the Appeal Brief of record, Pinski **teaches away** from the claimed invention by packaging foodstuff along with bacteria that do not appear to be adversely effected, inhibited, or killed.

In order for a *prima facie* case of obviousness to exist, three criteria must be shown: (1) a finding that the prior art included each element claimed; (2) a finding that one of ordinary skill in the art could have combined the elements as claimed by known methods wherein each element merely performs the same function as it does separately; and, (3) a finding that one of ordinary skill in the art would have recognized that the results of the combination were predictable. For the reasons articulated above, the criteria for obviousness have not been met. The Applicants have identified several elements that were not taught or suggested by the prior art. The Applicants have also identified teachings away such that the elements do not perform the same function as they do separately, and there would have been no expectation of success in arriving at the claimed invention.

In addition to a *prima facie* case of obviousness not being established, the Applicants further assert that the evidence of record has also rebutted obviousness. In particular, the results of the claimed combination were unexpected. One of ordinary skill in the art could not have combined the claimed elements by known methods, and the elements in combination do not merely perform the function that each element performs separately. The Applicants therefore respectfully request withdrawal of the instant rejection and seek allowance of all pending claims.

C. Claims 94-95 are patentable over Dunn in view of Enthoven and Friedman

Claims 94-95 were rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Dunn in view of Enthoven as applied above, and in further view of Friedman (U.S. 4,495,208; "Friedman").

The arguments asserted above with regard to Dunn and Enthoven are hereby reasserted and incorporated with respect to claims 94-95. The Applicants' currently claimed invention recites a method of inhibiting or killing microbes comprising *Salmonella* in food the method comprising treating the food with an organic acid composition comprising at least three organic acids, the organic acid composition comprising 2-hydroxy-4-(methylthio)butanoic acid and at least two organic acids chosen

from butyric acid, lactic acid, and propionic acid, wherein the organic acid composition inhibits or kills more *Salmonella* in the food compared to when the food is treated with any single organic acid that forms the organic acid composition. Whether alone or in combination, the cited art fails to teach the recited elements. It has been previously shown that Enthoven teaches away from Dunn, and does not provide any antimicrobial teachings with regard to HMB for *Salmonella* in feed.

Dunn in view of Enthoven and Friedman fail to teach **“a method of inhibiting or killing microbes comprising *Salmonella* in food** the method comprising treating the food with an organic acid composition **comprising at least three organic acids, the organic acid composition comprising 2-hydroxy-4-(methylthio)butanoic acid and at least two organic acids chosen from butyric acid, lactic acid, and propionic acid . . .**” as currently recited by the Applicants. Neither Dunn nor Friedman disclose 2-hydroxy-4-(methylthio)butanoic acid, and Enthoven has been shown to **teach away** from any antimicrobial activity with regard to *Salmonella* in feed. Furthermore, Friedman provides no teachings whatsoever regarding the inhibiting or killing of *Salmonella*, as currently claimed by the Applicants. It is respectfully submitted that all elements have not been taught or suggested as required by §103.

In order for a *prima facie* case of obviousness to exist, three criteria must be shown: (1) a finding that the prior art included each element claimed; (2) a finding that one of ordinary skill in the art could have combined the elements as claimed by known methods wherein each element merely performs the same function as it does separately; and, (3) a finding that one of ordinary skill in the art would have recognized that the results of the combination were predictable. For the reasons articulated above, the criteria for obviousness have not been met. The Applicants have identified several elements that were not taught or suggested by the prior art. The Applicants have also identified teachings away such that the elements do not perform the same function as they do separately, and there would have been no expectation of success in arriving at the claimed invention.

In addition to a *prima facie* case of obviousness not being established, the Applicants further assert that the evidence of record has also rebutted obviousness. In

particular, the results of the claimed combination were unexpected. One of ordinary skill in the art could not have combined the claimed elements by known methods, and the elements in combination do not merely perform the function that each element performs separately. The Applicants therefore respectfully request withdrawal of the instant rejection and seek allowance of all pending claims.

D. Claims 121-122, 124-125, 127-128, 130-131, and 134-136 are patentable over Dunn in view of Enthoven and Bland

Claims 121-122, 124-125, 127-128, 130-131, and 134-136 were rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Dunn in view of Enthoven as applied above, and in further view of Bland (U.S. 5,591,467; "Bland").

The arguments asserted above with regard to Dunn and Enthoven are hereby reasserted and incorporated with respect to claims 121-122, 124-125, 127-128, 130-131, and 134-136. The Applicants' currently claimed invention recites a method of inhibiting or killing microbes comprising *Salmonella* in food the method comprising treating the food with an organic acid composition comprising at least three organic acids, the organic acid composition comprising 2-hydroxy-4-(methylthio)butanoic acid and at least two organic acids chosen from butyric acid, lactic acid, and propionic acid, wherein the organic acid composition inhibits or kills more *Salmonella* in the food compared to when the food is treated with any single organic acid that forms the organic acid composition. Whether alone or in combination, the cited art fails to teach the recited elements. It has been previously shown that Enthoven teaches away from Dunn, and does not provide any antimicrobial teachings with regard to HMB for *Salmonella* in feed.

Dunn in view of Enthoven and Bland fail to teach **"a method of inhibiting or killing microbes comprising *Salmonella* in food** the method comprising treating the food with an organic acid composition **comprising at least three organic acids, the organic acid composition comprising 2-hydroxy-4-(methylthio)butanoic acid and at least two organic acids chosen from butyric acid, lactic acid, and propionic acid . . ."** as currently recited by the Applicants. Neither Dunn nor Bland disclose or suggest 2-hydroxy-4-(methylthio)butanoic acid, and Enthoven has been shown to teach

away from HMB having any antimicrobial activity with regard to *Salmonella* in feed. Furthermore, Bland provides a substantial teaching away by stating that propionic acid, formic acid, butyric acid. . . and combinations of these acids are **ineffective at killing *Salmonella* in animal feed**:

"[M]any compounds with known bacteriocidal properties, such as lactic acid, **propionic acid, formic acid, butyric acid**, sorbic acid, benzoic acid and combinations of these have been tested. While many of these agents kill bacteria in solution, **they do not kill all the bacteria in animal feedstuffs**. Woolford, M. K., "Microbiological Screening of Food Preservatives, Cold Sterilants and Specific Antimicrobial Agents as Potential Silage Additives", J. Sci. Ed. Agric. 1975, 26, 229-237. **To be effective against *Salmonella*, a bacteriocidal treatment must kill essentially all of the bacteria. Methods that kill 95% or even 99% are largely ineffective because the residual bacteria can multiply rapidly and recontaminate the feedstuff, and eventually the entire processing facility.**" See, e.g., Bland *et al.* at col. 2, lines 20-34. (Emphasis Added).

"A prior art reference must be considered in its entirety, *i.e.*, as a whole, including portions that would lead away from the claimed invention." See, e.g., MPEP § 2141.02; *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540 (Fed. Cir. 1983). Taken in context, Bland teaches away from the currently claimed invention and provides support for the unexpected result found by the Applicants.

In order for a *prima facie* case of obviousness to exist, three criteria must be shown: (1) a finding that the prior art included each element claimed; (2) a finding that one of ordinary skill in the art could have combined the elements as claimed by known methods wherein each element merely performs the same function as it does separately; and, (3) a finding that one of ordinary skill in the art would have recognized that the results of the combination were predictable. For the reasons articulated above, the criteria for obviousness have not been met. The Applicants have identified several elements that were not taught or suggested by the prior art. The Applicants have also identified teachings away such that the elements do not perform the same function as

they do separately, and there would have been no expectation of success in arriving at the claimed invention.

In addition to a *prima facie* case of obviousness not being established, the Applicants further assert that the evidence of record has also rebutted obviousness. In particular, the results of the claimed combination were unexpected. One of ordinary skill in the art could not have combined the claimed elements by known methods, and the elements in combination do not merely perform the function that each element performs separately. The Applicants therefore respectfully request withdrawal of the instant rejection and seek allowance of all pending claims.

E. Claims 114 and 120 are patentable over Dunn in view of Enthoven and Rolow

Claims 114 and 120 were rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Dunn in view of Enthoven as applied above, and in further view of Rolow (U.S. 6,355,289; "Rolow").

The arguments asserted above with regard to Dunn and Enthoven are hereby reasserted and incorporated with respect to claims 114 and 120. The Applicants' currently claimed invention recites a method of inhibiting or killing microbes comprising *Salmonella* in food the method comprising treating the food with an organic acid composition comprising at least three organic acids, the organic acid composition comprising 2-hydroxy-4-(methylthio)butanoic acid and at least two organic acids chosen from butyric acid, lactic acid, and propionic acid, wherein the organic acid composition inhibits or kills more *Salmonella* in the food compared to when the food is treated with any single organic acid that forms the organic acid composition. Whether alone or in combination, the cited art fails to teach the recited elements. It has been previously shown that Enthoven teaches away from Dunn, and does not provide any antimicrobial teachings with regard to HMB for *Salmonella* in feed.

Dunn in view of Enthoven and Rolow fail to teach "a method of inhibiting or killing microbes comprising *Salmonella* in food the method comprising treating the food with an organic acid composition comprising at least three organic acids, the

organic acid composition comprising 2-hydroxy-4-(methylthio)butanoic acid and at least two organic acids chosen from butyric acid, lactic acid, and propionic acid. . . .” as currently recited by the Applicants. Neither Dunn nor Rolow disclose 2-hydroxy-4-(methylthio)butanoic acid, and Enthoven has been shown to **teach away** from the use of HMB with regard to *Salmonella* in feed. Dunn, Enthoven, and Rolow all fail to teach or suggest lactic acid as currently claimed by Applicants. Furthermore, Rolow provides no teachings whatsoever regarding the inhibiting or killing of *Salmonella*, as currently claimed by the Applicants.

In order for a *prima facie* case of obviousness to exist, three criteria must be shown: (1) a finding that the prior art included each element claimed; (2) a finding that one of ordinary skill in the art could have combined the elements as claimed by known methods wherein each element merely performs the same function as it does separately; and, (3) a finding that one of ordinary skill in the art would have recognized that the results of the combination were predictable. For the reasons articulated above, the criteria for obviousness have not been met. The Applicants have identified several elements that were not taught or suggested by the prior art. The Applicants have also identified teachings away such that the elements do not perform the same function as they do separately, and there would have been no expectation of success in arriving at the claimed invention.

In addition to a *prima facie* case of obviousness not being established, the Applicants further assert that the evidence of record has also rebutted obviousness. In particular, the results of the claimed combination were unexpected. One of ordinary skill in the art could not have combined the claimed elements by known methods, and the elements in combination do not merely perform the function that each element performs separately. The Applicants therefore respectfully request withdrawal of the instant rejection and seek allowance of all pending claims.

F. Claims 123, 126, 129, and 132 are patentable over Dunn in view of Enthoven, Bland, and Rolow

Claims 123, 126, 129, and 132 were rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Dunn in view of Enthoven, in view of Bland, and in further in view of Rolow as applied above. All of the arguments asserted above with regard to Dunn, Enthoven, are hereby reasserted and incorporated with respect to claims 123, 126, 129, and 132.

Whether taken alone or in combination, Dunn, Enthoven, Bland, and Rolow fail to recite all of the elements recited by the currently pending claims. The Applicants have identified several elements that were not taught or suggested by the prior art. For example, not one of the cited references discloses or suggests the use of HMB for killing or inhibiting *Salmonella* in feed. The Applicants have also identified teachings away such that the elements do not perform the same function as they do separately, and there would have been no expectation of success in arriving at the claimed invention.

In addition to a *prima facie* case of obviousness not being established, the Applicants further assert that the evidence of record has also rebutted obviousness. In particular, the results of the claimed combination were unexpected. One of ordinary skill in the art could not have combined the claimed elements by known methods, and the elements in combination do not merely perform the function that each element performs separately. The Applicants therefore respectfully request withdrawal of the instant rejection and seek allowance of all pending claims.

G. Claims 75, 77-80, 82, 85, 96-103 are patentable over Van Oouen (WO 99/04646; “Van Oouen”) in view of Dunn

Claims 75, 77-80, 82, 85, 96-103 were rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable Van Oouen (WO 99/04646; “Van Oouen”) in view of Dunn. All of the arguments asserted above are hereby reasserted and incorporated with respect to claims 75, 77-80, 82, 85, and 96-103.

The rejections over Van Oouen in view of Dunn are moot in view of the currently amended claims. The basis for which Van Oouen was cited is no longer relevant.

The Applicants' currently claimed invention recites a method of inhibiting or killing microbes comprising *Salmonella* in food the method comprising treating the food with an organic acid composition comprising at least three organic acids, the organic acid composition comprising 2-hydroxy-4-(methylthio)butanoic acid and at least two organic acids chosen from butyric acid, lactic acid, and propionic acid, wherein the organic acid composition inhibits or kills more *Salmonella* in the food compared to when the food is treated with any single organic acid that forms the organic acid composition. Whether alone or in combination, the cited art fails to teach the recited elements.

Van Oouen in view of Dunn does not teach or suggest each and every claim element as currently recited. In combination, Van Oouen and Dunn both fail to teach or suggest "at least two organic acids chosen from butyric acid, lactic acid, and propionic acid." Van Oouen and Dunn also fail to teach or suggest "2-hydroxy-4-(methylthio)butanoic acid." Accordingly the combination of Van Oouen and Dunn fails to disclose, teach, or suggest a method comprising treating the food with an organic acid composition comprising at least three organic acids, the organic acid composition comprising 2-hydroxy-4-(methylthio)butanoic acid and at least two organic acids chosen from butyric acid, lactic acid, and propionic acid, wherein the organic acid composition inhibits or kills more *Salmonella* in the food compared to when the food is treated with any single organic acid that forms the organic acid composition

In order for a *prima facie* case of obviousness to exist, three criteria must be shown: (1) a finding that the prior art included each element claimed; (2) a finding that one of ordinary skill in the art could have combined the elements as claimed by known methods wherein each element merely performs the same function as it does separately; and, (3) a finding that one of ordinary skill in the art would have recognized that the results of the combination were predictable. For the reasons articulated above, the criteria for obviousness have not been met. The Applicants have identified several elements that were not taught or suggested by the prior art. The Applicants have also identified teachings away such that the elements do not perform the same function as

they do separately, and there would have been no expectation of success in arriving at the claimed invention.

In addition to a *prima facie* case of obviousness not being established, the Applicants further assert that the evidence of record has also rebutted obviousness. In particular, the results of the claimed combination were unexpected. One of ordinary skill in the art could not have combined the claimed elements by known methods, and the elements in combination do not merely perform the function that each element performs separately. The Applicants therefore respectfully request withdrawal of the instant rejection and seek allowance of all pending claims.

H. Claims 75-82 and 96 are patentable over Paquet in view of Dunn

Claims 75-82 and 96 were rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Paquet et al. (CA 1261855; "Paquet") in view of Dunn. All of the arguments asserted above are hereby reasserted and incorporated with respect to claims 75, 77-80, 82, 85, and 96-103.

The rejections over Paquet in view of Dunn are moot in view of the currently amended claims. The basis for which Paquet was cited is no longer relevant. Paquet fails to teach 2-hydroxy-4-(methylthio)butanoic acid.

The Applicants' currently claimed invention recites a method of inhibiting or killing microbes comprising *Salmonella* in food the method comprising treating the food with an organic acid composition comprising at least three organic acids, the organic acid composition comprising 2-hydroxy-4-(methylthio)butanoic acid and at least two organic acids chosen from butyric acid, lactic acid, and propionic acid, wherein the organic acid composition inhibits or kills more *Salmonella* in the food compared to when the food is treated with any single organic acid that forms the organic acid composition. Whether alone or in combination, the cited art fails to teach the recited elements.

Paquet in view of Dunn does teach or suggest each and every claim element as currently recited. In combination, Paquet and Dunn both fail to teach or suggest "at least two organic acids chosen from butyric acid, lactic acid, and propionic acid." Paquet and Dunn also fail to teach or suggest "2-hydroxy-4-(methylthio)butanoic acid."

Accordingly, the combination of Paquet and Dunn fails to disclose, teach, or suggest a method comprising treating the food with an organic acid composition comprising at least three organic acids, the organic acid composition comprising 2-hydroxy-4-(methylthio)butanoic acid and at least two organic acids chosen from butyric acid, lactic acid, and propionic acid, wherein the organic acid composition inhibits or kills more *Salmonella* in the food compared to when the food is treated with any single organic acid that forms the organic acid composition

In order for a *prima facie* case of obviousness to exist, three criteria must be shown: (1) a finding that the prior art included each element claimed; (2) a finding that one of ordinary skill in the art could have combined the elements as claimed by known methods wherein each element merely performs the same function as it does separately; and, (3) a finding that one of ordinary skill in the art would have recognized that the results of the combination were predictable. For the reasons articulated above, the criteria for obviousness have not been met. The Applicants have identified several elements that were not taught or suggested by the prior art. The Applicants have also identified teachings away such that the elements do not perform the same function as they do separately, and there would have been no expectation of success in arriving at the claimed invention.

In addition to a *prima facie* case of obviousness not being established, the Applicants further assert that the evidence of record has also rebutted obviousness. In particular, the results of the claimed combination were unexpected. One of ordinary skill in the art could not have combined the claimed elements by known methods, and the elements in combination do not merely perform the function that each element performs separately. The Applicants therefore respectfully request withdrawal of the instant rejection and seek allowance of all pending claims.

I. Claims 75, 77, 97, 99-103, 113-117, and 133 are patentable over Doerr in view of Rolow

Claims 75, 77, 97, 99-103, 113-117, and 133 were rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Doerr et al. (Poultry Science, 74 (1), 23,

1995; "Doerr") in view of Rolow. All of the arguments asserted above are hereby reasserted and incorporated with respect to claims 75, 77, 97, 99-103, 113-117, and 133.

Doerr is cited by the Office as allegedly providing anti-mold activity, which is not pertinent to the currently pending claims. Doerr provides no teachings or suggestions whatsoever regarding *Salmonella* in feed. Enthoven provides evidence that HMB is ineffective with regard to *Salmonella* in feed. Thus, the Office's reliance on Doerr is contradicted by Enthoven and one of ordinary skill in the art would have no reasonable expectation of success in arriving at the currently claimed invention. The rejections over Doerr in view of Rolow are moot considering the currently amended claims. The basis for which Doerr was cited is no longer relevant.

The Applicants' currently claimed invention recites a method of inhibiting or killing microbes comprising *Salmonella* in food the method comprising treating the food with an organic acid composition comprising at least three organic acids, the organic acid composition comprising 2-hydroxy-4-(methylthio)butanoic acid and at least two organic acids chosen from butyric acid, lactic acid, and propionic acid, wherein the organic acid composition inhibits or kills more *Salmonella* in the food compared to when the food is treated with any single organic acid that forms the organic acid composition. Whether alone or in combination, the cited art fails to teach the recited elements. Specifically, Doerr in view of Rolow fails to teach or suggest 2-hydroxy-4-(methylthio)butanoic acid and at least two organic acids chosen from butyric acid, lactic acid, and propionic acid as being effect at inhibiting or killing microbes comprising *Salmonella* in feed.

In order for a *prima facie* case of obviousness to exist, three criteria must be shown: (1) a finding that the prior art included each element claimed; (2) a finding that one of ordinary skill in the art could have combined the elements as claimed by known methods wherein each element merely performs the same function as it does separately; and, (3) a finding that one of ordinary skill in the art would have recognized that the results of the combination were predictable. For the reasons articulated above, the criteria for obviousness have not been met. The Applicants have identified several elements that were not taught or suggested by the prior art. The Applicants have also

identified teachings away such that the elements do not perform the same function as they do separately, and there would have been no expectation of success in arriving at the claimed invention.

In addition to a *prima facie* case of obviousness not being established, the Applicants further assert that obviousness has also been rebutted by the evidence of record. In particular, the results of the claimed combination were unexpected. One of ordinary skill in the art could not have combined the claimed elements by known methods, and the elements in combination do not merely perform the function that each element performs separately. The Applicants therefore respectfully request withdrawal of the instant rejection and seek allowance of all pending claims.

(VI) Conclusion

In light of the foregoing, the applicants request entry of the amendments to the claims, withdrawal of the claim rejections, and solicit an allowance of all pending claims. The Commissioner is hereby authorized to charge any and all fees that may be required or credit any overpayment to Deposit Account No. 50-1662.

Polsinelli Shughart PC
Respectfully Submitted,

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